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EXAMINER BRAINARD, TIMOTHY A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,498

Applicant(s)

LEWIN ET AL.

Examiner

TIMOTHY A. BRAINARD

Art Unit

3662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/31/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-32 and 34-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-32 and 34-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/888)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-2, 5, 16, 34-38, 41-43, and 46 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1, 4, 6 and 7 of copending Application No. 10/534495 in view of Sorimachi et al (US 4867570). Application claims (claim 1) an illumination means for illuminating a scene with a projected two dimensional array of light spots, the illumination means comprises a light source arranged to illuminate only part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct source light spots towards the scene (claim 1), (claim 34) the light guide comprises a tube having a square

cross section (claim 4), (claim 35) wherein the light guide comprises a tube having reflective internal surfaces, (claim 6), (claim 36) the light guide comprises a tube of solid material adapted such that a substantial amount of light incident at an interface between the material of the tube and surrounding material undergoes total internal reflection (claim 7).

2. Application 10/534495 does not claim a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot, the processor is adapted to resolve any possible ambiguity in range to each spot, the detector comprises a two dimensional CCD or CMOS array, the projection optics comprises a projection lens, the light source is arranged to illuminate the input face of the light guide through a mask, the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide, the light sources are arranged in a regular pattern, the light sources are arranged to provide differing spot densities, the light source has a shape which is not symmetric about a reflection axis of the light guide.

3. Sorimachi teaches (claim 1) a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot (col 1, lines 23-31 and fig 1), (claim 2) the illumination means and detector are arranged

such that each spot in the projected array appears to move in the detected scene, from one range to another, along an axis and the axis of apparent motion of each adjacent spot in the projected array is different (fig 1), (claim 5) the processor is adapted to resolve any possible ambiguity in range to each spot (col 2), (claim 16) the detector comprises a two dimensional CCD or CMOS array (col 5 lines 5-10), (claim 37) the projection optics comprises a projection lens (fig 1 item 2), (claim 38) the light source is arranged to illuminate the input face of the light guide through a mask (fig 1, item 3), (claim 41) the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide (fig 1, item 3), (claim 42) the light sources are arranged in a regular pattern (fig 2, item 3), (claim 43) the light sources are arranged to provide differing spot densities (fig 1 and 2), (claim 46) the light source has a shape which is not symmetric about a reflection axis of the light guide (fig 2).

4. It would have been obvious to modify 10/534495 to include a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot because it is one of multiple applications of the transmitter of 10/534495 with no new or unexpected results. It would have been obvious to modify 10/534495 to include the processor is adapted to resolve any possible ambiguity in range to each spot, the detector comprises a two dimensional CCD or CMOS array, the projection optics comprises a projection lens, the light source is arranged to illuminate

the input face of the light guide through a mask, the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide, the light sources are arranged in a regular pattern, the light sources are arranged to provide differing spot densities, the light source has a shape which is not symmetric about a reflection axis of the light guide because each is one of multiple design choices with no new or unexpected results.

5. This is a provisional obviousness-type double patenting rejection.
6. Claims 3 and 4 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Hosterman (US 3589815).
7. Sorimachi teaches the illumination means adapted to project an array of spots which are non-circular in shape when focused. It would have been obvious to modify application 10/534495 to include the illumination means adapted to project an array of spots which are non-circular in shape when focused because it is one of multiple design choices with no new or unexpected results.
8. Hosterman teaches the illumination means adapted to project an array of spots which is focused at a first distance and unfocussed at a second distance, the first and second distance within the operating range of the apparatus (abs).
9. It would have been obvious to modify application 10/534495 in view of Sorimachi to include the illumination means adapted to project an array of spots which is focused at a first distance and unfocussed at a second distance, the first and second distance

within the operating range of the apparatus because it help determine distance faster with multiple focus distances.

10. This is a provisional obviousness-type double patenting rejection.

11. Claims 7-12 and 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Kuroda.

12. Kuroda teaches (claim 7 and 8) the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and (claim 9) the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity, (claim 10-12) the illumination means is adapted to so as to produce an array of spots wherein at least some projected spots have a different color or shape to adjacent spots, (claim 48) periodically redirecting the array of spots on the scene (para 8 and fig 4B).

13. It would have been obvious to modify Application 10/534495 in view of Sorimachi to include the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity or the illumination means is adapted to so as to produce an array of spots wherein at least some projected spots have a different color or shape to adjacent spots and periodically redirecting the array of spots on the scene because each is just one of

multiple ways to manipulate the transmitted light that will give information about the distance to the projected spot on the object with no new or unexpected result.

14. This is a provisional obviousness-type double patenting rejection.

15. Claim 13 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Holec (US 6392744).

16. Holec teaches the spots comprise intersections between continuous lines (col 1, lines 29-52). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include the spots comprise intersections between continuous lines because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results.

17. This is a provisional obviousness-type double patenting rejection.

18. Claim 14-15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi in view of Holec as applied to claim 13 above, and further in view of Takehana (US 4740806).

19. Sorimachi teaches the processor is adapted to determine the range to the spots then by using the determined range information determine the range between the points (col 2). It would have been obvious to modify application 10/534495 to include the processor is adapted to determine the range to the spots then by using the determined

range information determine the range between the points because it is one of multiple design choices with no new or unexpected results.

20. Takehana teaches the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal. It would have been obvious to modify Application 10/534495 in view of Sorimachi in view of Holec to include the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results.

21. This is a provisional obviousness-type double patenting rejection.

22. Claim 17-18 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of and Uomori (US 6618123).

23. Sorimachi teaches (claim 17) the illumination means is adapted such that the two dimensional array of spots (col 4, lines 7-50), (claim 18) the detector is adapted to capture a visible image of the scene as well as the location of the infrared spots in the scene (col 5, lines 5-30). It would have been obvious to modify application 10/534495 to include the illumination means is adapted such that the two dimensional array of spots (col 4, lines 7-50), (claim 18) the detector is adapted to capture a visible image of the scene as well as the location of the infrared spots in the scene because it is one of multiple design choices with no new or unexpected results.

24. Uomori teaches the spots being infrared spots (col 5, lines 65 – col 6, lines 9). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include the spots being infrared spot because it is one of multiple design choices with no new or unexpected results.

25. This is a provisional obviousness-type double patenting rejection.

26. Claim 19 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of and Linn et al (US 2004/0149841).

27. Linn teaches the baseline between the illumination means and the detector is between 50 and 100 mm. It would have been obvious to modify Application 10/534495 in view of Sorimachi to include teaches the baseline between the illumination means and the detector is between 50 and 100 mm because it is one of multiple design choices with no new or unexpected results.

28. This is a provisional obviousness-type double patenting rejection.

29. Claim 20, 22-24, and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Taka (US 6700651).

30. Sorimachi teaches the processor applies image processing algorithms to the scenes from each viewpoint to determine the range (col 2). It would have been obvious to modify application 10/534495 to include he processor applies image processing

algorithms to the scenes from each viewpoint to determine the range because it is one of multiple design choices with no new or unexpected results.

31. Taka teaches (claims 20, 22, and 23) the detection system adapted to image the scene from two different directions (col 2, lines 21-39). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include the detection system adapted to image the scene from more than two different directions because it makes the distance measurement more accurate. With respect to claim 30, the processor is adapted to determine the possible range to the scene when illuminated with each illumination means and compare the possible ranges to resolve any ambiguity is inherent in the combination of application 10/534498 in view of Sormachi in view of Taka.

32. This is a provisional obviousness-type double patenting rejection.

33. Claim 21 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi in view of Uomori as applied to claim 18 above, and further in view of Andersson (US 6545749).

34. Andersson teaches the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector (col 5, lines 33-42). It would have been obvious to modify Application 10/534495 in view of Sorimachi in view of Uomori to include the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector because it would allow the operator to scan an area.

35. This is a provisional obviousness-type double patenting rejection.

36. Claim 25 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi in view of Taka as applied to claim 20 above, and further in view of Nonaka et al (US 6801639).

37. Nonaka teaches the detector means adapted to have a different baseline to the illumination means in each viewpoint (fig 5a). It would have been obvious to modify Application 10/534495 in view of Sorimachi in view of Taka to include the detector means adapted to have a different baseline to the illumination means in each viewpoint because it is one of multiple placements of the detectors with no new or unexpected results.

38. This is a provisional obviousness-type double patenting rejection.

39. Claim 27 and 39 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi in view of Taka as applied to claim 20 above, and further in view of Maimon (US 6480265).

40. Maimon teaches the baseline of the two viewpoints lie along different axes (fig 9). It would have been obvious to modify Application 10/534495 in view of Sorimachi in view of Taka to include the baseline of the two viewpoints lie along different axes because it is one of multiple placements of the detectors with no new or unexpected results. Sorimachi teaches the light source illuminates with a non-circular shape (fig 2). It would have been obvious to modify

41. This is a provisional obviousness-type double patenting rejection.
42. Claim 28 and 31 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Ono (US 6538751).
43. Ono teaches a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector (fig 1). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector because it is one of multiple placements of the transmitters with no new or unexpected results.
44. This is a provisional obviousness-type double patenting rejection.
45. Claim 29, 30, 32, and 40 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi in view of Ono as applied to claim 28 above, and further in view of Kuroda (US 2003/0128361).
46. Kuroda teaches the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics (para 8 and fig 4b). It would have been obvious to modify Application 10/534495 in view of Sorimachi in view of Ono to include the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics because each is

just one of multiple ways to manipulate the transmitted light that will be reflected and detected giving information about the distance to the projected spot on the object with no new or unexpected result. Sorimachi teaches the light source illuminates the input face of the light guide with a shape which is non symmetric about the axis of reflection of the light guide (fig 2). With respect to claim 30, the processor is adapted to determine the possible range to the scene when illuminated with each illumination means and compare the possible ranges to resolve any ambiguity is inherent in the combination of application 10/534495 in view of Sormachi in view of Ono.

47. This is a provisional obviousness-type double patenting rejection.

48. Claim 44 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 41 above, and further in view of Marchi (US 6512575).

49. Marchi teaches at least one light source emits light at a different wavelength to another light source. It would have been obvious to modify Application 10/534495 in view of Sorimachi to include at least one light source emits light at a different wavelength to another light source because it is one of multiple design choices with no new or unexpected results.

50. This is a provisional obviousness-type double patenting rejection.

51. Claim 45 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/534495 in view of Sormachi as applied to claim 41 above, and further in view of Ariyama et al (US 2003/0012115).

52. Ariyama teaches at light one light source is shaped differently to another light source. It would have been obvious to modify Application 10/534495 in view of Sorimachi to include at light one light source is shaped differently to another light source because it is one of multiple design choices with no new or unexpected results.

53. This is a provisional obviousness-type double patenting rejection.

54. Claim 47 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 41 above, and further in view of Katz (US 5012453).

55. Katz teaches at least one light source is located within the light guide at a different depth to another light source. It would have been obvious to modify Application 10/534495 in view of Sorimachi to include at least one light source is located within the light guide at a different depth to another light source because it is one of multiple design choices with no new or unexpected results.

56. This is a provisional obviousness-type double patenting rejection.

57. Claim 49 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Rudd et al (US 5519204).

58. Rudd teaches a ranging apparatus further comprising a location sensor (col 4, lines 14-25). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a ranging apparatus further comprising a location sensor because it is one of multiple design choices with no new or unexpected results.

59. This is a provisional obviousness-type double patenting rejection.

60. Claim 50 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Farmer (US 5748295).

61. Farmer teaches a proximity sensor incorporated in a ranging apparatus (col 9, lines 24-35). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a proximity sensor incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

62. This is a provisional obviousness-type double patenting rejection.

63. Claim 51 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Rajchel et al (US 6719654).

64. Rajchel teaches target identification incorporated in a ranging apparatus (col 1, lines 43-49). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a target identification incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

65. This is a provisional obviousness-type double patenting rejection.
66. Claim 52 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Frucht (US 5910767).
67. Frucht teaches intruder detection incorporated in a ranging apparatus (col 1, lines 35-43). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include an intruder detection incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.
68. This is a provisional obviousness-type double patenting rejection.
69. Claim 53 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Ittycheriah et al (US 6580814).
70. Ittycheriah teaches a biometric modeling apparatus incorporated in a ranging apparatus (abs). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a biometric modeling apparatus incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.
71. This is a provisional obviousness-type double patenting rejection.
72. Claim 54 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/534495 in view of Sormachi as applied to claim 1 above, and further in view of Nakashima (US 6721465).

73. Nakashima teaches a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature (col 7, lines 47-62). It would have been obvious to modify Application 10/534495 in view of Sorimachi to include a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature because it is one of multiple design choices with no new or unexpected results.

74. This is a provisional obviousness-type double patenting rejection.

75. Claims 1-2, 5, 16, 34-38, 41-43, and 46 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1, 11, 12, and 13 of copending Application No. 10/534494 in view of Sorimachi et al (US 4867570). Application claims (claim 1) an illumination means for illuminating a scene with a projected two dimensional array of light spots, the illumination means comprises a light source arranged to illuminate only part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct source light spots towards the scene (claim 1), (claim 34) the light guide comprises a tube having a square cross section (claim 11), (claim 35) wherein the light guide comprises a tube having

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reflective internal surfaces, (claim 6), (claim 12) the light guide comprises a tube of solid material adapted such that a substantial amount of light incident at an interface between the material of the tube and surrounding material undergoes total internal reflection (claim 13).

76. Application 10/534495 does not claim a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot, the processor is adapted to resolve any possible ambiguity in range to each spot, the detector comprises a two dimensional CCD or CMOS array, the projection optics comprises a projection lens, the light source is arranged to illuminate the input face of the light guide through a mask, the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide, the light sources are arranged in a regular pattern, the light sources are arranged to provide differing spot densities, the light source has a shape which is not symmetric about a reflection axis of the light guide.

77. Sorimachi teaches (claim 1) a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot (col 1, lines 23-31 and fig 1), (claim 2) the illumination means and detector are arranged such that each spot in the projected array appears to move in the detected scene, from

one range to another, along an axis and the axis of apparent motion of each adjacent spot in the projected array is different (fig 1), (claim 5) the processor is adapted to resolve any possible ambiguity in range to each spot (col 2), (claim 16) the detector comprises a two dimensional CCD or CMOS array (col 5 lines 5-10), (claim 37) the projection optics comprises a projection lens (fig 1 item 2), (claim 38) the light source is arranged to illuminate the input face of the light guide through a mask (fig 1, item 3), (claim 41) the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide (fig 1, item 3), (claim 42) the light sources are arranged in a regular pattern (fig 2, item 3), (claim 43) the light sources are arranged to provide differing spot densities (fig 1 and 2), (claim 46) the light source has a shape which is not symmetric about a reflection axis of the light guide (fig 2).

78. It would have been obvious to modify 10/534494 to include a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot because it is one of multiple applications of the transmitter of 10/534494 with no new or unexpected results. It would have been obvious to modify 10/534494 to include the processor is adapted to resolve any possible ambiguity in range to each spot, the detector comprises a two dimensional CCD or CMOS array, the projection optics comprises a projection lens, the light source is arranged to illuminate the input face of the light guide through a mask, the illumination means comprises more

than one light source, each light source arranged to illuminate part of the input face of the light guide, the light sources are arranged in a regular pattern, the light sources are arranged to provide differing spot densities, the light source has a shape which is not symmetric about a reflection axis of the light guide because each is one of multiple design choices with no new or unexpected results.

79. This is a provisional obviousness-type double patenting rejection.

80. Claims 3 and 4 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Hosterman (US 3589815).

81. Sorimachi teaches the illumination means adapted to project an array of spots which are non-circular in shape when focused. It would have been obvious to modify application 10/534494 to include the illumination means adapted to project an array of spots which are non-circular in shape when focused because it is one of multiple design choices with no new or unexpected results.

82. Hosterman teaches the illumination means adapted to project an array of spots which is focused at a first distance and unfocused at a second distance, the first and second distance within the operating range of the apparatus (abs).

83. It would have been obvious to modify application 10/534494 in view of Sorimachi to include the illumination means adapted to project an array of spots which is focused at a first distance and unfocused at a second distance, the first and second distance

within the operating range of the apparatus because it help determine distance faster with multiple focus distances.

84. This is a provisional obviousness-type double patenting rejection.

85. Claims 7-12 and 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Kuroda.

86. Kuroda teaches (claim 7 and 8) the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and (claim 9) the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity, (claim 10-12) the illumination means is adapted to so as to produce an array of spots wherein at least some projected spots have a different color or shape to adjacent spots, (claim 48) periodically redirecting the array of spots on the scene (para 8 and fig 4B).

87. It would have been obvious to modify Application 10/534494 in view of Sorimachi to include the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity or the illumination means is adapted to so as to produce an array of spots wherein at least some projected spots have a different color or shape to adjacent spots and periodically redirecting the array of spots on the scene because each is just one of

multiple ways to manipulate the transmitted light that will give information about the distance to the projected spot on the object with no new or unexpected result.

88. This is a provisional obviousness-type double patenting rejection.

89. Claim 13 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Holec (US 6392744).

90. Holec teaches the spots comprise intersections between continuous lines (col 1, lines 29-52). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include the spots comprise intersections between continuous lines because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results.

91. This is a provisional obviousness-type double patenting rejection.

92. Claim 14-15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi in view of Holec as applied to claim 13 above, and further in view of Takehana (US 4740806).

93. Sorimachi teaches the processor is adapted to determine the range to the spots then by using the determined range information determine the range between the points (col 2). It would have been obvious to modify application 10/534494 to include the processor is adapted to determine the range to the spots then by using the determined

range information determine the range between the points because it is one of multiple design choices with no new or unexpected results.

94. Takehana teaches the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal. It would have been obvious to modify Application 10/534494 in view of Sorimachi in view of Holec to include the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results.

95. This is a provisional obviousness-type double patenting rejection.

96. Claim 17-18 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of and Uomori (US 6618123).

97. Sorimachi teaches (claim 17) the illumination means is adapted such that the two dimensional array of spots (col 4, lines 7-50), (claim 18) the detector is adapted to capture a visible image of the scene as well as the location of the infrared spots in the scene (col 5, lines 5-30). It would have been obvious to modify application 10/534494 to include the illumination means is adapted such that the two dimensional array of spots (col 4, lines 7-50), (claim 18) the detector is adapted to capture a visible image of the scene as well as the location of the infrared spots in the scene because it is one of multiple design choices with no new or unexpected results.

98. Uomori teaches the spots being infrared spots (col 5, lines 65 – col 6, lines 9). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include the spots being infrared spot because it is one of multiple design choices with no new or unexpected results.

99. This is a provisional obviousness-type double patenting rejection.

100. Claim 19 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of and Linn et al (US 2004/0149841).

101. Linn teaches the baseline between the illumination means and the detector is between 50 and 100 mm. It would have been obvious to modify Application 10/534494 in view of Sorimachi to include teaches the baseline between the illumination means and the detector is between 50 and 100 mm because it is one of multiple design choices with no new or unexpected results.

102. This is a provisional obviousness-type double patenting rejection.

103. Claim 20, 22-24, and 26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Taka (US 6700651).

104. Sorimachi teaches the processor applies image processing algorithms to the scenes from each viewpoint to determine the range (col 2). It would have been obvious to modify application 10/534494 to include he processor applies image processing

algorithms to the scenes from each viewpoint to determine the range because it is one of multiple design choices with no new or unexpected results.

105. Taka teaches (claims 20, 22, and 23) the detection system adapted to image the scene from two different directions (col 2, lines 21-39). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include the detection system adapted to image the scene from more than two different directions because it makes the distance measurement more accurate. With respect to claim 30, the processor is adapted to determine the possible range to the scene when illuminated with each illumination means and compare the possible ranges to resolve any ambiguity is inherent in the combination of application 10/534494 in view of Sormachi in view of Taka.

106. This is a provisional obviousness-type double patenting rejection.

107. Claim 21 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi in view of Uomori as applied to claim 18 above, and further in view of Andersson (US 6545749).

108. Andersson teaches the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector (col 5, lines 33-42). It would have been obvious to modify Application 10/534494 in view of Sorimachi in view of Uomori to include the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector because it would allow the operator to scan an area.

109. This is a provisional obviousness-type double patenting rejection.

110. Claim 25 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi in view of Taka as applied to claim 20 above, and further in view of Nonaka et al (US 6801639).

111. Nonaka teaches the detector means adapted to have a different baseline to the illumination means in each viewpoint (fig 5a). It would have been obvious to modify Application 10/534494 in view of Sorimachi in view of Taka to include the detector means adapted to have a different baseline to the illumination means in each viewpoint because it is one of multiple placements of the detectors with no new or unexpected results.

112. This is a provisional obviousness-type double patenting rejection.

113. Claim 27 and 39 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi in view of Taka as applied to claim 20 above, and further in view of Maimon (US 6480265).

114. Maimon teaches the baseline of the two viewpoints lie along different axes (fig 9). It would have been obvious to modify Application 10/534494 in view of Sorimachi in view of Taka to include the baseline of the two viewpoints lie along different axes because it is one of multiple placements of the detectors with no new or unexpected results. Sorimachi teaches the light source illuminates with a non-circular shape (fig 2). It would have been obvious to modify

115. This is a provisional obviousness-type double patenting rejection.

116. Claim 28 and 31 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Ono (US 6538751).

117. Ono teaches a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector (fig 1). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector because it is one of multiple placements of the transmitters with no new or unexpected results.

118. This is a provisional obviousness-type double patenting rejection.

119. Claim 29, 30, 32, and 40 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi in view of Ono as applied to claim 28 above, and further in view of Kuroda (US 2003/0128361).

120. Kuroda teaches the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics (para 8 and fig 4b). It would have been obvious to modify Application 10/534494 in view of Sorimachi in view of Ono to include the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics because each is

just one of multiple ways to manipulate the transmitted light that will be reflected and detected giving information about the distance to the projected spot on the object with no new or unexpected result. Sorimachi teaches the light source illuminates the input face of the light guide with a shape which is non symmetric about the axis of reflection of the light guide (fig 2). With respect to claim 30, the processor is adapted to determine the possible range to the scene when illuminated with each illumination means and compare the possible ranges to resolve any ambiguity is inherent in the combination of application 10/534494 in view of Sormachi in view of Ono.

121. This is a provisional obviousness-type double patenting rejection.

122. Claim 44 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 41 above, and further in view of Marchi (US 6512575).

123. Marchi teaches at least one light source emits light at a different wavelength to another light source. It would have been obvious to modify Application 10/534494 in view of Sorimachi to include at least one light source emits light at a different wavelength to another light source because it is one of multiple design choices with no new or unexpected results.

124. This is a provisional obviousness-type double patenting rejection.

125. Claim 45 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

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10/534494 in view of Sormachi as applied to claim 41 above, and further in view of Ariyama et al (US 2003/0012115).

126. Ariyama teaches at light one light source is shaped differently to another light source. It would have been obvious to modify Application 10/534494 in view of Sorimachi to include at light one light source is shaped differently to another light source because it is one of multiple design choices with no new or unexpected results.

127. This is a provisional obviousness-type double patenting rejection.

128. Claim 47 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/534494 in view of Sormachi as applied to claim 41 above, and further in view of Katz (US 5012453).

129. Katz teaches at least one light source is located within the light guide at a different depth to another light source. It would have been obvious to modify Application 10/534494 in view of Sorimachi to include at least one light source is located within the light guide at a different depth to another light source because it is one of multiple design choices with no new or unexpected results.

130. This is a provisional obviousness-type double patenting rejection.

131. Claim 49 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Rudd et al (US 5519204).

132. Rudd teaches a ranging apparatus further comprising a location sensor (col 4, lines 14-25). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a ranging apparatus further comprising a location sensor because it is one of multiple design choices with no new or unexpected results.

133. This is a provisional obviousness-type double patenting rejection.

134. Claim 50 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Farmer (US 5748295).

135. Farmer teaches a proximity sensor incorporated in a ranging apparatus (col 9, lines 24-35). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a proximity sensor incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

136. This is a provisional obviousness-type double patenting rejection.

137. Claim 51 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Rajchel et al (US 6719654).

138. Rajchel teaches target identification incorporated in a ranging apparatus (col 1, lines 43-49). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a target identification incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

139. This is a provisional obviousness-type double patenting rejection.

140. Claim 52 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Frucht (US 5910767).

141. Frucht teaches intruder detection incorporated in a ranging apparatus (col 1, lines 35-43). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include an intruder detection incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

142. This is a provisional obviousness-type double patenting rejection.

143. Claim 53 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Ittycheriah et al (US 6580814).

144. Ittycheriah teaches a biometric modeling apparatus incorporated in a ranging apparatus (abs). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a biometric modeling apparatus incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

145. This is a provisional obviousness-type double patenting rejection.

146. Claim 54 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No.

10/534494 in view of Sormachi as applied to claim 1 above, and further in view of Nakashima (US 6721465).

147. Nakashima teaches a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature (col 7, lines 47-62). It would have been obvious to modify Application 10/534494 in view of Sorimachi to include a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature because it is one of multiple design choices with no new or unexpected results.

148. This is a provisional obviousness-type double patenting rejection.

Response to Arguments

1. Applicant's arguments filed 10/31/2008 have been fully considered.
2. Applicant argues that the broadest application of the group 10/534498, 10534495, and 10534494 should be allowed and then the improvement applications (498 and 494) should be allowed after submission of terminal disclaimers. Since current application is an improvement of the broadest application 10/534495, application 10/534495 should be allowed first. Current application will then be allowed with terminal disclaimers.
3. Application 10/534494 has been allowed and the current application requires a terminal disclaimer before allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY A. BRAINARD whose telephone number is (571) 272-2132. The examiner can normally be reached on Monday - Friday 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571) 272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TAB

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